5-2020

Implementation of a Digital Asset Management System using Human-Centered Design

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A capstone submitted in partial fulfillment of the requirements for the degree of

Master of Science in Media Arts & Technology from the

School of Photographic Arts and Science in the

College of Art and Design at the Rochester Institute of Technology

May 2020

Capstone Advisor: Professor Christine Heusner

Acknowledgements

This capstone project would not have been possible without the help and support from many people. I would first like to thank my co-workers and managers in the Strategic Marketing and Communications Department for supporting my master's program journey and participating in the many workshops that made this project possible. I also want to thank my capstone advisor, Christine Heusner, for all our meetings throughout the year to keep me on track and provide clarity when things seemed too complicated. In addition, I would like to thank my former colleague, Sally Dixon, for helping me to proofread and copyedit my capstone in order for me to sound as professional and correct as humanly possible. Finally, I would like to thank my good boy, Jojo, for putting up with the many nights when I couldn't throw the stuffed animal across the room for him, because I was busy writing my paper.

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Abstract

With all the people and activities involved, modern marketing and strategic communications departments are complex organizations. This complexity can lead to longer lead times to complete projects within specific and deadline-driven timeframes. Therefore, companies are turning to digital asset management (DAM) systems to streamline their workflows and become more efficient. However, without a comprehensive and strategic implementation plan, DAM systems are significantly less likely to be adopted by their end-users. This paper describes how a DAM system was selected and implemented in the marketing and strategic communications department of a large health system. By using a human-centered design methodology to reflect and encompass the needs of its end-users, DAM system configurations such as metadata fields, keywords, file structure, and user permissions were developed by consensus. These configurations were then implemented to resolve a wide range of frustrations expressed by the end-users.

Introduction

Many components are involved in planning a marketing project, whether for a for-profit or not-for-profit business. These projects can include different layers of people, from creatives who write, design, photograph, and produce video, to marketing advisors, project managers, and managers who work with clients to plan and gain approvals for campaigns before they are launched. The complexity of this dynamic system increases as more people and interactions are involved. These complexities can result in long decision processes and lead times to complete essential projects on time (Kovács, 2004). Therefore, businesses are eager to find methods to reduce marketing-process lead times and find ways for complex, multi-dimensional communication systems to collaborate more efficiently.

To become efficient in the marketing process, companies have turned to digital asset management (DAM) software systems. DAM systems serve as collaboration and central storage platforms that allow digital files to be accessed and shared by various users within an organization (Kovács, 2004). While many individuals and businesses try to define a DAM system as a way to manage information in the digital age, DAM systems can also be considered a business strategy designed to increase revenues by reducing workflow and cycle times (Wager, 2015).

Once a DAM system has been implemented in an enterprise setting, the ability to streamline the acquisition, storage, retrieval, and distribution of digital media can benefit the organization in a wide variety of ways. The most significant benefits are workflow efficiency along with quality assurance and control, which result in the reduction of cycle times (Kovács, 2004). In turn, this optimized system can shrink costs while increasing revenue through better cooperation, management, and communication (Wager, 2015).

However, without a strategy behind the implementation of a DAM system, not only can organizational and searchability issues arise, but they can also affect the adoption rate of the software by the end-users. DAM systems are distinctly customizable systems configured to specific requirements. These unique requirements include selected metadata, user-permission configuration, and the process of managing and finding assets (Carner, 2019).

There are two basic approaches to setting up a DAM: a technology-centered approach, where the functionality and constraints of the system dictate the set-up, and a human-centered approach, where the overarching framework of processes incorporates the needs and wants from end-users. Choosing the human-centered approach can increase user adoption rates of the DAM system due to the intuitive configuration that makes for a better user experience (Carner, 2019).

While the software development field has used the concept and practice of human-centered design, the applications of this approach towards DAM systems are still novel. Since DAM systems are not one-size-fits-all, the human-centered methodology to implement this system can vary depending on the needs and requirements of the organization, while factoring in the amount of time allowed to develop this type of system (Carner, 2019). Therefore, extensive research is essential in order to understand the methodology for a human-centered DAM system that aligns with the circumstances and available resources an organization can provide.

Statement of Problem

In dynamic marketing systems, there is an extensive network of staff involved in creating, managing, and executing marketing campaigns. With multiple people using different workflows that interact with each other, this system can become increasingly complex, resulting in long decision processes and lead times to execute a campaign within a specific timeframe.

To streamline the workflow, enterprises are turning to digital asset management (DAM) systems (Kovács, 2004). However, without an implementation strategy that involves and incorporates the needs and preferences of those who will be using the system, users will be less likely to adopt it, even if it's required by management (Carner, 2019). As a result, this will continue the issues of long lead times and quality control, which can negatively impact the return on investments for the business. Therefore, this research project will explore the implementation of a DAM system through a human-centered methodology that not only addresses the issue of streamlining workflows, but that also increases the adoption rates of its users within the timeframe and resources that are allowed by the organization.

Literature Review

This literature review will first define a digital asset management system along with its purpose. Next, the complex workflows between various members within the marketing and communications department are examined. Finally, the DAM implementation method of human-centered design is assessed in its effects on the system's adoption by end-users.

Digital Asset Management Systems

Over the last decade, individuals and companies have tried to define digital asset management (DAM). Various terminologies describe the concept of managing digital files, from media asset management to general asset management; many of these terms fall under digital asset management (Wager, 2005). Keathley (2014) defines a DAM system as a software system that "stores and distributes digital assets in a controlled and uniform way" (p. 3). Another definition for a DAM system is "the set of tasks and decisions surrounding the ingesting, annotating, cataloging, storage, and retrieval of digital assets" (Babeanu, Gavrila, & Mares, 2009, p. 318). While these definitions are slightly different, the consensus is that a DAM system is an application that stores digital assets, links to metadata, and provides access to users.

While the purpose of DAM systems primarily focuses on the electronic management of assets and files, it can also be a business strategy for organizations. Wagner (2005) states that DAM systems can strategically "increase revenues while reducing workflow and process cycle times" (p. 40). The functionality built within DAM systems can reduce time inefficiencies in the value chain while increasing revenue through tracking and better management of assets. Data sets from DAM systems help to validate or improve business strategies (Babeanu, Gavrila, & Mares, 2009). Research also indicates that implementing DAM systems can give companies a competitive advantage by providing remote access to assets for global teams, which increases

cooperation, collaboration and communication (Kovács, 2004). In a recent journal article, Shapiro (2017) also adds that DAM systems are not just information systems for storage. Through integrations with other software systems, companies have found unique ways to utilize the valuable metadata output from DAM platforms. This useful data, in conjunction with consumer behavior, have been used to gain insights into the direction of future campaigns to elevate a company's business (Shapiro, 2017).

Although DAM systems are prevalent in a range of industries, recent peer-reviewed research has focused primarily on institutions such as archives, libraries, and cultural heritage organizations. These research articles focused on implementing a brand-new DAM system to store digitalized asset collections or migrating an existing DAM system to a better-suited system for the institution (e.g., Sewell et al., 2019; Matusiak, Tyler, Newton and Polepeddi, 2017; Weidner et al., 2017). As a result, there are only a few current studies of DAM systems within the marketing and communications industry.

Dynamic Marketing Systems

Strategic marketing and communications departments serve vital functions in all types of corporations and organizations. From not-for-profits and small businesses to Fortune 500 companies, marketing and communications play a fundamental role in the contribution and achievement of organizational goals (Zerfass & Volk, 2018). Despite the significance of strategic marketing in businesses, there still is little empirical research on how marketing dynamics and functions bring value to corporations (Moss, Likely, Sriramesh and Ferrari, 2017; Zerfass & Volk, 2018; Köhler & Zerfass, 2019). Marketing departments contribute to businesses by communicating corporate messages internally and externally through various media channels

that support functions in day-to-day operations, build for future success, and provide information for strategic development of the organization (Zerfass & Volk, 2018).

For marketing and strategic communication departments to remain successful in their goals, a strong team dynamic is crucial. Roles within marketing traditionally centered on two basic positions. One was public relations managers, who manage the relationships, and the other, public relations technicians, who create the assets such as imagery and text. In contemporary research, these roles have expanded into multifaceted segments that include consultants and business supporters (Zerfass & Volk, 2018). While research in this area is limited, a study by Moss, Likely, Sriramesh and Ferrari (2017) found that while there is no single, dominant model of departmental structure, roles and responsibilities are segmented down to external and internal communications, crisis management, media relations, and web-based activity within a one-to three-layer hierarchical structure (Moss, Likely, Sriramesh and Ferrari, 2017). The research also acknowledged that effective departmental structure facilitated various efficiencies, such as the allocation of resources, the ability to support corporate functions, clear control over accountabilities and responsibilities, and the capability to work in an integrated setting (Moss, Likely, Sriramesh and Ferrari, 2017).

Based on the various layers of this dynamic departmental marketing structure, a project's complexity can affect the team's output and value. Project complexity has been debated and defined in various ways. Still, the commonalities have described it as a system in which multiple components, that are related to some degree, interact with each other through managed coordination, communication, and control (Cristóbal, Carral, Diaz, Fraguela, and Iglesias, 2018). Specific to marketing dynamics, the complexity of the system increased as more people and interactions were involved. One possible outcome from this complexity can be a lengthy decision

process and lead times to complete essential projects within specific timeframes (Kovács, 2004). However, if managed efficiently, adverse outcomes can be avoided. As a result, timely and relevant information can increase innovation, product value, and performance (Mostaghel, Oghazi, Patel, Parida, and Hultman, 2019). Successful communication can also be beneficial to reaching business goals, organizational success, and effective internal and external messaging (Falkheimer et al., 2016). Therefore, it's vital to find ways to streamline and reduce the complexities involved in a complex work environment.

DAM Implementation Strategies

DAM systems are considered commercial enterprise software, but unlike many software programs that fall into that category, DAM systems do not come preconfigured. Instead, configuration depends on the requirements of the purchaser. These unique conditions include keywords, metadata fields, and user-permission controls to manage and find assets (Carner, 2019).

When an enterprise is ready to set up and implement a DAM system, there are two approaches. The first is the traditional, technology-centered approach, where the configurations constrain the availability of options in the chosen platform. The other is the human-centered approach, where the end-users' needs are included from the beginning to determine the platform's configurations (Carner, 2019). For the traditional, technology-centered approach, a DAM system is chosen based on the business-driven goals and financial impact on the organization, which are set by executive management (Wager, 2005). As a result, these DAM system configurations are not intuitive and create a poor user experience that result in end-users who are less likely to adopt this new system into their workflows (Carner, 2019).

Human-centered design for DAM implementation. This design process is a model that incorporates the needs of users at every stage of the software-development lifecycle. It's used to help better define end-user needs, requirements, and limitations (Majid, Noor, and Adnan, 2019). Through its application, human-centered design of a DAM can provide a better experience to help drive the adoption of the system by its end-users (Carner, 2019). While it traditionally has been used in software design and mobile applications, the literature shows this concept can also apply to the configuration of information systems, like DAM systems (Carner, 2019; Van Malssen, 2019). Although there is a limited amount of research on human-centered design specific to a DAM system, two similar approaches stand out.

In the approach proposed by Carner (2019), human-centered design is applied by the process of understanding end-users, by bringing them into the DAM system discussions from the start, identifying their needs and wants, and conducting collective intelligence workshops (Carner, 2019). In the case study presented, a three-to-five-year DAM system reconfiguration was implemented at a company with an existing DAM system that had low adoption rates. The human-centered design methodology started with a discovery phase conducted by a contracted vendor to understand the needs and wants of the end-users. These discoveries were then used as a baseline for group workshops. During the workshops, the group developed key personas that would interact with the DAM system, with defined responsibilities and actions within the system. The workshops were followed by the development of journey maps for each persona to better understand the actions, touchpoints, moods, and challenges. Once completed, the information helped to formulate the collective intelligence workshops. These workshops allowed teams to come to a consensus on decisions, which then informed the metadata, keyword, and user-permission configurations to resolve frustrations in the existing system. As a result, the new,

user-centric relaunch of the DAM system enabled a shift in the end-users' mindset, who then reengaged and adopted the system into their workflow (Carner, 2019).

In a similar human-centered approach, Van Malssen (2019) focused her DAM system configuration on a scenario-driven approach. This approach puts users front and center as a reminder to design the system for end-users to achieve specific goals (Van Malssen, 2019). These scenarios are created based on research into the needs, requirements, and workflows from all key stakeholders, encouraging them to feel invested in how the future system should work. Scenarios are used to help ground the narrative taken from real-world experiences while also including a future vision, where users imagine how the new system would integrate with their particular workflows to reach established goals. Each scenario reflected the end-users' needs and included a list of personas that would interact with the system, a narrative description with a unique setting, and the expected outcome of each situation.

The next step was to select the DAM system that could encompass the requirements of the critical stakeholders. When the vendor was selected, the scenarios were revisited to help determine configuration requirements, such as metadata and search functions. Once implemented, and using the scenarios and personas created, usability testing of the system was done to confirm that the DAM system was successful. After the DAM system was launched, scenarios could be reexamined to improve the functionality and usability of the system as user needs continued to change and grow (Van Malssen, 2019).

Based on a review of the current literature on DAM system benefits, the dynamics of a DAM system within marketing and strategic communications, and DAM implementation strategies, few studies have focused on the process of a DAM system configuration. To contribute to this gap of knowledge, the research presented will provide guidance on how to

implement a DAM system within a marketing and strategic communications department using a human-centered design methodology.

Research Objectives

Marketing and strategic communications departments are complex and dynamic systems. As the number of people who work on a project or campaign increases, the more complex the workflow becomes, which can result in long lead times. Companies are implementing digital asset management systems, also known as DAM systems, to create efficiency in their workflows.

However, without an implementation strategy that involves and incorporates end-users' needs, any DAM system will be less likely to be adopted and utilized by the users.

The project goals for strategically implementing a DAM system using human-centered design were as follows:

1. Determine stakeholder needs, workflows, and requirements for the digital asset management system.
2. Determine the digital asset management vendor and system that fits the stakeholders' needs.
3. Configure the digital asset management system using a human-centered design methodology that includes metadata fields, keywords, file structure, and user permissions.

Methodology

A step-by-step, human-centered design approach was used to configure the DAM system for stakeholders who work in the strategic marketing and communications department at a healthcare system. The methodology was divided into four sections shown in Figure 1.

1. Identified key stakeholder groups who would be using the DAM system. Workshops were conducted to establish the needs, assets types used, metadata fields, workflows, and pain points.
2. Created personas based on the information gathered from the workshops. Focus groups were then conducted to confirm or modify the data collected from the previous workshops.
3. Selected a DAM system and vendor based on research of DAM system features that satisfied stakeholders' needs and requirements.
4. Configured and developed the DAM system, as chosen by the organization. Based on the focus group information, metadata fields, keywords, file structure, and user permissions were configured within the DAM system.

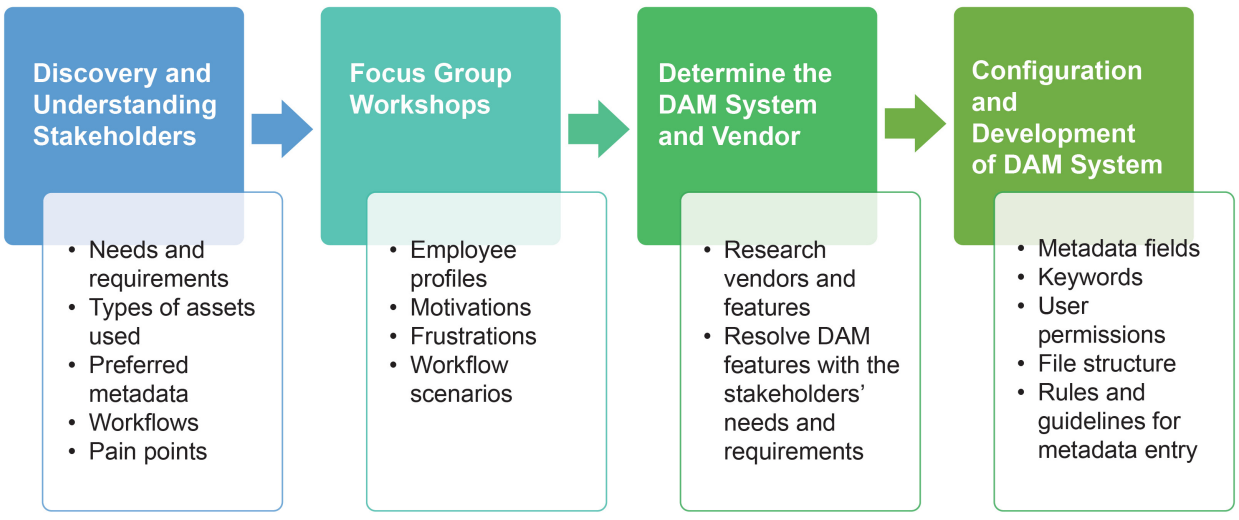

Figure 1. Methodology workflow illustrated in four sections with an overview and specific tasks.

Discovery and Stakeholders

The participants for this case study were employees who worked in the strategic marketing and communications department at a healthcare system located in Rochester, NY. The department is made up of 48 employees with various roles and responsibilities that include management, marketing, internal communications, creative services, web development, and social marketing. These various workgroups interact with each other to complete projects on timelines determined by project managers. The participants were chosen for this study not only because the researcher worked at this institution, but because this group also encapsulated the dynamic marketing group described in the literature review.

Discovery workshops. The employees who worked in the marketing and strategic communications department were interviewed, and key stakeholders were identified. These stakeholders were selected because they would become the ultimate users of the DAM system. They were then placed into groups that represented similar backgrounds and skills, which resulted in the following groups: video producers, photographers, designers, copywriters, visual effects artists, marketing and communication advisors, managers, web specialists, social media marketers, and traffic managers.

Each group participated in a workshop conducted by the researcher. During these discovery workshops, the researcher facilitated the conversations to determine:

1. Needs or requirements of the DAM system
2. The different assets that groups worked with
3. Suggested metadata fields that would help with asset searchability
4. The project workflows of each group
5. Any frustrations or pain points each group had with their current workflows

Focus Group Workshops

Once the discovery workshops were completed, the information gathered was used to inform the researcher about the next step in the methodology: focus group workshops. Based on information gained through the literature review, the focus group workshops utilized a combination of both Carner's and Van Malssen's methods on personas and scenario-building (Carner, 2019; Van Malssen, 2019) .Some established groups were then condensed into clusters based on their similar workflows, needs or requirements, and assets used. As a result, eight focus groups were created: video producers, designers, copywriters, marketing and communication advisors, managers, web specialists, social media marketers, and traffic managers.

Persona creation. Using the information from the discovery workshops, personas were created for each group to help facilitate focus group discussions. Each persona profile consisted of a stock photo from a creative commons website, a fictional name, title at the organization, employee profile, motivations, frustrations, and a scenario that was based on day-to-day workflow activities. The employee profile information was taken from the job description provided by the organization, and the motivations, frustrations, and scenario were constructed from information gained in the focus group workshops. The persona for a copyrighter is shown in Figure 2.

Carolyn
Copywriter

Employee Profile:
- Worked at the company for a year and half
- Has a bachelor's degree in communication studies
- Knowledgeable in AP writing style
- Has worked on large and smaller campaigns
- In-depth proofing capabilities
- Works in a highly matrixed group with many collaborators

Motivations:
- To create engaging, easy-to-understand stories that are accurate and current while also adhering to brand standards
- Create compelling content to build brand awareness in the community and beyond
- Maintain best practices while diversifying content

Frustrations:
- Approval process of content is not streamlined
- Inability to share files on large projects outside of her immediate group

Carolyn has been a copywriter for a year and a half. When a writing project is assigned, she usually will take time to outline and research the topic before developing copy. Since writing takes concentration, some of the copy she develops may be done offsite, without access to the internal server or work computer. Once finished, the copy goes through a series of approvals. Once approved, she hands it off to the design team.

Figure 2. Copywriter persona that was created for the focus group. Includes name, title, employee profile, motivations, frustrations, and a workflow scenario.

Focus groups. The goal of each focus group workshop was to acquire input from the participants in the process of creating a persona in order to confirm or modify the information shown in each persona profile. Each group was guided through the persona sections and prompted with questions to facilitate discussions.

First section: Employee Profiles. The purpose of the Employee Profiles section was to have participants feel represented in the personas they created. Participants reviewed and analyzed each statement that was presented. They were then asked by the moderator specific prompt questions including, What would you change in this profile? What would you add? What doesn't represent you? Are there any experiences missing from this profile for someone who has

worked at this company for this amount of time? As a group, participants agreed with the statements, changed the statements, or added information.

Second section: Motivation. This section helped the researcher understand the group's workflows and goals. Participants again reviewed and analyzed each statement presented. The moderator asked prompt questions similar to those during the employee profiles section to facilitate discussion. Participants then agreed, disagreed, or added additional statements.

Third section: Frustrations. The moderator asked a series of questions to uncover employee frustrations with the current project workflow, ranging from how a project is initiated to the finished output and the systems involved. Discussions reflected the pain points and needs discovered in the focus group workshops. Participants reviewed the statements and in-depth prompt questions were asked. These questions covered requirements in the process, frustration points in the workflows, information that was missing from projects that affected their process, frustrations working with assets, and technologies that did not meet the needs of the employee. As a group, participants changed or added frustration points to the list.

Final section: Workflow Scenarios. These were developed based on the workflow discussions from the group workshops. The scenarios were set up in paragraph form that took the participants through a persona user's journey from start to finish with a project. Each scenario outlined the interaction of various technologies, including the setup of the server and folder structure used. It also included some unique situations, like working remotely, or certain emotional experiences when working with other groups. With the prompts asked by the moderator, participants had the opportunity to change or add information to the scenario. The scenarios were used to discuss what was working or not working with the file structure, what files the group wanted access to, and which groups they did not want touching their files.

The focus group workshops and personas development helped to establish the metadata fields, keywords, file structure, and user permissions covertly, versus overtly. The reasoning for establishing these configurations covertly was that participants had never experienced using a DAM system, and therefore these human-centered activities were able to gain the information from the end-users that was necessary to inform the system configuration.

Keywords. In addition to the persona confirmations, participants were asked to think about keywords they would use to tag assets to be searched within the DAM system. Using a modified open card-sort methodology, participants were supplied with Post-it notes, a marker, and a set of assets, including posters, stationery, tri-folds, and cards, to help prompt relevant keywords. Participants were then asked to write down one keyword per Post-it note for five minutes. Broad and narrow terms were encouraged. After five minutes, each participant placed each keyword on a scale that ranged from most likely to be searched to least likely to be searched. Similar keywords were stacked on top of each other. Once all participants added their Post-it notes to the scale, the group came to a consensus to determine if the keywords were placed in the correct area.

The Selection of the DAM System and Vendor

After completing the discovery workshops and focus groups, the next step was to select a digital asset management system that would fit the specified requirements stated by the stakeholders. With many DAM systems available at the enterprise level, it was important to find a software system that was flexible and scalable to meet all of the end-users' needs. Answers and statements from the discovery workshops and focus groups were examined. From the discovery workshops, the statements from the Needs/Requirements section were analyzed, and from the focus groups, the Frustrations and Workflow scenarios were analyzed. These needs and

requirements were then complied and separated into different functionality groups, including storage and asset capabilities, permissions and security, metadata ability, workflow benefits, and third-party integration.

Once the needs and requirements were examined, the next step was to research the available DAM systems and features. A list of enterprise DAM systems was compiled that satisfied the requirements of the functionality groups. Each DAM system was reviewed and features were highlighted in a document.

To choose the system that was the best fit for the organization, the features of these DAM systems had to resolve the users' needs and requirements. For example, the DAM system would need to be able to ingest all the asset types the users produced, including images, video, animations, audio, documents, and project files. In addition, the system would need features to manage the rights and restrictions of certain assets, including customized metadata fields with controlled vocabulary and versioning of files, and to relate separate assets together through tagging. Based on these requirements, the list of potential DAM systems was narrowed further to DAM systems that incorporated extra features that would streamline the end-users' workflows, such as artificial intelligence incorporation and API integration. This left a few system choices and one DAM system was selected.

Configuration and Development of the DAM System

The development of the digital asset management system focused on four areas: metadata fields, keywords, file structure and user permissions.

A metadata field refers to a user-selected set of data that provides information about digital assets. This data can be structured by controlled vocabularies or schema requirements.

Keywords are terms that can be tagged to assets that have not been addressed in the metadata fields. These terms can be in the form of a taxonomy, where there is an established relationship between parent/child terms, or a thesaurus, where various terms are used to describe the same item, or a combination of both.

File structure refers to the organization of the files that will be ingested into the DAM system. It can be configured with multi-level subcategories or as a flat structure that utilizes the search side options to find assets.

Lastly, user permissions control the access for different user groups and can include viewing, adding, editing, sharing, and deleting assets.

Metadata determination. To determine the first iteration of metadata fields that will be configured in the prototype DAM system, the personas that the stakeholders confirmed were analyzed. Many of the metadata fields were created based on the Frustrations section. To pull metadata fields out of the stakeholders' frustrations, the statements were compiled together in a Microsoft Word document. Metadata-related frustrations were highlighted and isolated. Those statements were then aligned to a metadata field that would resolve this frustration.

For example, a common frustration among the stakeholders was not knowing who worked on a project prior to a new iteration. Therefore, a set of metadata fields such as Designer, Advisor, Writer, and Video Producer would be established. In addition, any frustration statements related to tagging were added to the keyword list. Controlled vocabularies were also included to maintain consistent naming. Lastly, the commonality of frustrations determined if certain metadata fields were mandatory, recommended, or optional.

Keyword determination. The configuration of keywords was determined from the modified open-sort activity. All keywords generated by the stakeholders were transferred to a

Microsoft Excel spreadsheet for analysis. Additional keywords were identified from the Frustrations section of the personas and were also added to the keyword list. Repeated keywords were merged together, the information gathered from the keywords scale was considered, and terms that were deemed less searched for were removed from the list. For example, the keyword "animation" was suggested by multiple stakeholders and held a high scale rating for searching, so it would be added to the list. On the other hand, the keyword "bicep" was only suggested once and was on the lower end of the scale for searching, so it was removed. Once the final list was determined, narrow terms were grouped together and a broad term was created to describe the group.

For example, narrow terms like "fonts," "gradient," "ink drops," "texture," and "blue" were grouped together and a broad term of "Attribute" was used to label this group. Associated keywords within each set were then grouped together and a preferred term was chosen based on the number of times the term was mentioned in the modified open-sort activity. Lastly, if keyword terms overlapped with a metadata field, they were removed from the list. For example, "File Type" was determined to be a metadata field, thus any terms identifying the file type were removed from the keywords list. Once reduced, the remaining keywords were imported to a Microsoft Excel spreadsheet and arranged for ingestion by the DAM system.

File structure and user permissions configuration. The last two configurations, determining file structure and user permissions, were configured based on information from the workflow scenarios. By sorting through statements about what worked and what didn't in the current file structure, these workflow statements helped determine if the current system was preferred or rearranged to accommodate the needs of the stakeholders who would be working with the system.

In addition, analyzing the statements about accessing files not currently available to specific stakeholders, as well as the statements about not having other groups access assets, helped determine the user groups and permission levels.

By using the human-centered design approach to configure the digital asset management system, the stakeholders' needs, asset types used, metadata fields, workflows and pain points were established through discovery workshops. This led to the creation of personas and focus groups, which helped to confirm or modify information from the discovery workshops. Once the information was gathered and analyzed, the DAM system vendor was chosen and the metadata fields, keywords, file structure, and user permission were configured. The next chapter will discuss the results of this methodology.

Results and Discussion

After using the human-centered design approach to understand the stakeholders' needs and requirements, choosing a DAM system and vendor, and configuring the unique requirements for searchability, the results are presented as follows.

Understanding the Stakeholders' Needs and Requirements

The results from this section addresses project goal 1, which is determining the stakeholders needs, workflow, and requirements for the digital asset management system. Using a human-centered design methodology, the stakeholders participated in discovery and focus groups in order to better understand their needs and frustrations. In the discovery phase, stakeholders were placed into groups based on similar backgrounds and skills. During these sessions, stakeholders expressed what they wanted to see in the DAM system, the types of assets they used, information they would like assets to have, their project workflows and pain points within the workflows.

As a result, stakeholders expressed their needs, which included storage and asset capabilities, permissions and security, metadata ability, workflow benefits, and third-party integration for the DAM system. For types of assets, the stakeholders specified files ranging from documents and photos to project files that included animation, design and video. For suggested information aimed at searchability, some common fields that came up were featured person or people in the image or project, which department the asset fell under, and the date the asset was completed. Lastly, project workflows and pain points determined how the end-users worked through a project from start to finish.

The information from the discover groups informed the creation of the personas that were created for the focus groups. These personas helped the stakeholders relate to and feel invested in

the discussion process. The personas were developed using four categories: Employee Profiles, Motivations, Frustrations and a Workflow scenario for each persona. Going through each section with the stakeholder groups helped participants further invest and reaffirm the previous frustration and workflow information determined through the discovery workshops.

As a result, some of the frustrations that were reiterated included: not knowing who had previously worked on a project, whether assets were used in other department projects or potentially overused, which department projects fell under, and that finding assets in general had been difficult.

Selecting the DAM Vendor and System

The results from this section addresses project goal 2, which is determine the digital asset management vendor and system that fits the stakeholders' needs. When selecting the DAM vendor and system that would benefit the stakeholders and organization, system features had to resolve the needs and requirements of the end-users. The requirements were taken from the human-centered discovery workshops and the focus groups and sorted into the different types of needs, including storage and asset capabilities, permissions and security, metadata capability, workflow benefits, and third-party integration. Once those requirements were compared to the different enterprise DAM system features, the vendor the organization ultimately selected was Orange Logic's Cortex DAM system.

The Cortex DAM was chosen for its robust and flexible system. According to Orange Logic's website (2018), Cortex DAM is a cloud-based system that can be scalable to grow with the needs of the organization. Features of this system include supporting various file types from images, video, graphics, audio, documents, project files, and other file formats such as Zip. It has built-in security, where user permissions and asset rights can be enforced with specific

requirements. Metadata fields can be customized with a controlled vocabulary, and the system allows advanced search functions based on preferred and non-preferred keywords. Versioning is available for all types of assets, collections can be created from the assets, and the system can establish relationships between assets. In addition, Cortex DAM had supplementary features not found in other DAM systems that will benefit end-user workflows, such as commenting and annotation for video, API integration with other software, artificial intelligence for keywording and face identification, and a public-facing website that would allow non-registered users to search for assets considered to be public-facing, such as logos (Orange Logic, 2018). With so many features that resolved the stakeholders' requirements, this system was chosen as the best fit for the organization.

DAM System Configuration

The results from this section addresses project goal 3, which is to configure the DAM system using a human-centered design methodology that includes metadata fields, keywords, file structure, and user permissions. The configuration of the DAM system was informed by the data gathered from the human-centered focus groups. The focus group information was used to determine the metadata fields, keywords, file structure, and permissions.

Metadata fields. The statements gathered from the Frustrations section of the focus groups helped determine the metadata fields to be used for the searchability of assets. All frustrations were compiled and any statement that a metadata field could resolve was isolated. This resulted in the creation of 28 metadata fields, which consisted of descriptive, administrative, and process metadata. For descriptive metadata, fields included were Title, Description, Requestor, Service Line, Campaign Name, Subject, Tactic Type, Creator, and Keywords. For administrative metadata, fields included were Date of Completion, File Type, and Version. For

process metadata, fields included were Job Number, Title, Approved By, Copy Approved By, Brand Approved By.

By viewing the frequency of particular frustrations that came up during the focus groups, certain fields were deemed mandatory and considered must-have information for assets, included: Job Number, Title, Service Line, Tactic Type, Creator, Date of Completion, File Type, Version, and Keywords. Fields considered recommended, or good to have information for assets, included: Description, Requestor, Advisor, Designer, Writer, Location, and Usage Rights. The remaining metadata fields were considered optional, or information not crucial to an asset, such as: Subject, Featured Person, Location Type, Approved By, Copy Approved By, and Brand Approved By. This metadata schema is shown in Table 1.

Table 1

Metadata Schema for Mandatory, Recommended, and Optional Fields

Mandatory Fields	Recommended Fields	Optional Fields
Job Number	Description	Subject
Title	Requestor	Featured Person
Service Line	Advisor	Location Type
Tactic Type	Designer	Approved By
Creator	Writer	Copy Approved By
Date of Completion	Location	Brand Approved By
File Type	Usage Rights	
Version		
Keywords		

A recommended controlled hybrid vocabulary was required of some metadata fields to maintain the integrity and consistency of the metadata. The hybrid vocabulary allows end-users to select predetermined terms with the option of open-text submission if the term didn't appear on the list. Metadata fields that utilized recommended vocabulary were Service Line, Tactic Type, Location, Location Type and File Type. These fields included local controlled vocabulary

except for File Type, which included vocabulary from the Internet Assigned Numbers Authority organization. For a full metadata list, reference appendix A.

Keywords. The terms gathered from the modified open-sort activity, where the end-users wrote down words they would search for, helped determine the keywords to be inputted into the DAM system. Keywords were sorted and grouped into a hierarchy of broad terms and narrow terms. In total there were 153 keywords created with 12 broad term groups. These broad term groups were Tactic Type, Services, Status, Attributes, Assets, Profession, Campaign Type, Process, Employment Status, Social, Usage, and Miscellaneous. The largest group of keywords fell under the broad term Tactic Type, with 48 narrow term keywords. Each term described the purpose of the asset including Banner Image, Copy, Cling, Invite, and PowerPoint. The other groups had a range of two to 38 narrow terms that fell under one of the broad terms. Once the keywords were grouped, associated terms from each broad term group were identified and the preferred term was chosen from the number of times the term came up in the open-sort activity. For example, under Tactic Type, "giveaways," "premiums," "promotional," and "swag" described the same tactic, and since "swag" was repeated multiple times, it was considered the preferred term. For a full list of keywords, reference appendix C.

File Structure. Statements from the human-centered workflow scenario discussions informed whether the current file structure needed to be modified before ingesting it into the DAM system. Stakeholders in each group expressed similar frustrations about how the current file structure was not ideal. The main frustration was that the file structure was inconsistent between the different end-user groups. For example, the designer group had their files organized by the department the requests came from, also known as the service line. However, the advisors placed their documents in personal folders on the server. This filing system proved to be

disorganized and confusing to users since related files couldn't be associated. Many end-users expressed that they would like to see all files from every group structured first by departments, then by users or group – such as design, writing, marketing, video – and then by project. By organizing the files this way, all related assets could be in one place, rather than scattered among the different groups. Although stakeholders would prefer to see one large folder structure, the Cortex DAM system file structure is tied to user permissions. This means end-user group permissions are assigned to the top-level folder and therefore, one top-level folder cannot have multiple user permissions. As a result, the file structure will be similar to the current set-up where each end-user group will have a top-level folder, followed by the department, then project. This solution keeps the files organized in the way the stakeholders ideally wanted, while projects can also be linked together through the metadata. The new file structure is shown in Figure 3.

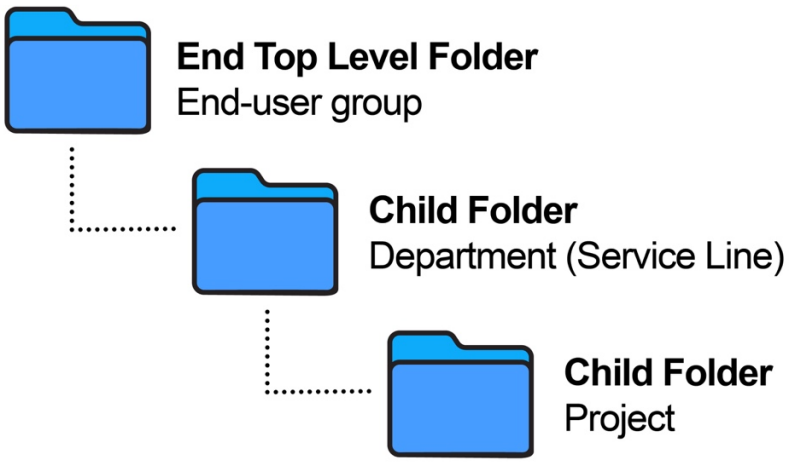

Figure 3. File folder structure that will be set up in the Cortex DAM system. Top-level folder will consist of the end-user group, followed by the department name, and the project name.

Permissions. Statements about file access from the workflow scenario discussions helped determine the permissions of the end-users within the DAM system. Stakeholders from each group expressed which files they would like to access and which groups they would not want

accessing their files. The end-user group that expressed the most restrictions with their files was the Design and Copywriter group, while the Web and Social Media group expressed the fewest restrictions when it came to others accessing their files. After compiling these statements and analyzing them, each group had such specific requirements that multiple user permission groups were created: Administrator, Unregistered Users, Staff–Marketing Communications, Staff–Public Relations, Staff–Creative Services, Staff–Video Production, Staff–Web, Staff–Manager, Staff–Super User, and Staff–User. Each end-user group's permissions corresponded to the top-level folder in the file structure. This meant that the Marketing Communications end-user group would be able to read and write files under the Marketing folder, but not modify files in the other top-level folders.

The results of the methodology satisfied the goals of the project. Stakeholders needs and requirements were assessed and analyzed through the discovery workshops and focus groups. The DAM system chosen satisfied the stakeholders' needs. Lastly, the configuration of the DAM system was determined from the information gained in the human-centered design approach.

Conclusions

When it comes to setting up and configuring digital asset management systems, there are two paths available: the traditional technology-centered or the human-centered design approach. By using the human-centered design methodology to configure this DAM system, the stakeholders were able to be involved in the process and have their voices heard. By expressing the successes and frustrations related to their current project workflows, the end-users provided insights about how processes could be improved in order to complete projects more efficiently. In turn, their investment this process was used to encourage the stakeholders to use the new system once it was implemented and launched.

Through the combination of Carner's persona (2019) and Van Malssen's scenario (2019) methodologies, this human-centered design approach to configure the DAM system helped to uncover the end-users' needs and preferences. By determining their needs and wants in the discovery workshops and then using that information to create personas that included the workflow scenarios, the discussion in the focus groups reaffirmed important frustrations that needed to be resolved. The insights from the end-users helped to establish the configuration of the DAM system covertly versus overtly. By interpreting end-users' frustrations and workflows to create metadata fields, keywords, file structure, and user permissions, this method was a reasonable approach for the end-users as all of them had never used a DAM system.

Although the human-centered approach to configure information systems like the DAM is fairly novel, it is an effective and efficient way to set up a system that is user-friendly and meets more of the end-users' needs (Carner, 2019; Van Malssen, 2019). Instead of taking years to complete this methodology, the process from start to finish took four months.

This methodology could also be applied to DAM system implementation in various industries outside of marketing and communications. However, it is recommended to have a dedicated champion or project manager onsite to gather these insights and to act as a liaison between the stakeholders and DAM system vendor for the system's successful configuration and implementation. Without a dedicated person onsite, the process involved in getting the system up and running could be significantly delayed due to the lack of coordination and key insights about the system's users. An extensive amount of information is required by the DAM system vendor in order to customize the system, including end-user workflows, user preferences for permissions, file structure, and the type of assets to be stored in the system.

Limitations

Although the configurations of the DAM system were completed, a usability study to test task success and functionality of the system was not preformed due to time constraints. In addition, although the DAM system's primary goal was to help streamline the end-users' workflows, the new system would not be expected to resolve all project workflow frustrations due to the complex and dynamic workflows in the Marketing and Strategic Communications Department. In order to fully streamline efficiencies within the organization, other aspects, such as project timelines and task accountability, would also need to be reviewed and refined.

Future Work

While this project concluded the first sprint of the implementation of the Cortex DAM system, future work would include performing usability testing to determine if the configurations were a success and refine the parts that were not. This applies to keywords and user permissions. Due to the ever-evolving nature of DAM systems and the people who use them, configuration

improvement is cyclical, and therefore future work will always be needed to improve the system and meet the needs of its end-users.

In addition, the human-centered design methodology involved in implementing this DAM system could also be applied to the same types of complex work groups within other industries. Therefore, this method is not limited just to marketing and communications groups in healthcare, but could be used in various organizations that produce and utilize large amounts of digital assets.

Reference List

Babeanu, D., Gavrila, A. A., & Mares, V. (2009). Strategic outlines: between value and digital assets management. *Annales Universitatis Apulensis : Series Oeconomica*, *11*(1), 318-324. Retrieved from http://www.oeconomica.uab.ro/upload/lucrari/1120091/33.pdf

Carner, M. (2019). A human-centred design approach to digital asset management: User experience as a foundation for system-configuration design. *Journal of Digital Media Management, 7*(4), 357–365. Retrieved from https://www.henrystewartpublications.com/jdmm/v7

Cristóbal, J. R. S., Carral, L., Diaz, E., Fraguela, J. A., & Iglesias, G. (2018). Complexity and Project Management: A General Overview. *Complexity*, *2018*, 1–10. doi: 10.1155/2018/4891286

Keathley, E. F. (2014). Digital asset management: Content architectures, project management, and creating order out of media chaos. New York, NY: Apress.

Köhler, K., & Zerfass, A. (2019). Communicating the corporate strategy. *Journal of Communication Management*, *23*(4), 348–374. doi: 10.1108/JCOM-10-2018-0106

Kovacs, G. (2004). Digital asset management in marketing communication logistics. Journal of Enterprise Information Management, 17(3), 208-218. doi:http://dx.doi.org.ezproxy.rit.edu/10.1108/17410390410531452

Majid, R. A., Noor, N. L. M., & Adnan, W. A. W. (2019). Human Centered Design Approach as a Technology Capability: Integration of the Management Perspectives in the Human Centered Software Developemnt Process. *Journal of Engineering and Applied Sciences*, *14*(6), 9272–9277. doi: 10.36478/jeasci.2019.9272.9277

Matusiak, K. K., Tyler, A., Newton, C., & Polepeddi, P. (2017). Finding access and digital preservation solutions for a digitized oral history project. *Digital Library Perspectives*, *33*(2), 88–99. doi: 10.1108/dlp-07-2016-0025

Moss, D., Likely, F., Sriramesh, K., & Ferrari, M. A. (2017). Structure of the public relations/communication department: Key findings from a global study. *Public Relations Review*, *43*(1), 80–90. doi: 10.1016/j.pubrev.2016.10.019

Mostaghel, R., Oghazi, P., Patel, P. C., Parida, V., & Hultman, M. (2019). Marketing and supply chain coordination and intelligence quality: A product innovation performance perspective. *Journal of Business Research*, *101*, 597–606. doi: 10.1016/j.jbusres.2019.02.058

Orange Logic. (2018). *Digital Asset Management System Features.* Retrieved from https://www.orangelogic.com/digital-asset-management-features.

Sewell, R. R., Potvin, S., Melgoza, P., Creel, J. S., Huff, J. T., Bailey, G. T., Wright, B. J. (2019). When a Repository Is Not Enough: Redesigning a Digital Ecosystem to Serve Scholarly Communication. *Journal of Librarianship and Scholarly Communication, 7*(1). doi: 10.7710/2162-3309.2225

Shapiro, J. (2017). How one creative agency used metadata to unlock value for its clients. *Journal of Digital Media Management*, *6*(1), 78–85.

Tullis, T., & Albert, B. (2013). *Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics*. Amsterdam: Elsevier.

Wager, S. (2005). Digital asset management, media asset management, and content management: From confusion to clarity. *Journal of Digital Asset Management*, *1*(1), 40-45. doi:http://dx.doi.org.ezproxy.rit.edu/10.1057/palgrave.dam.3640008

Weidner, A., Watkins, S., Scott, B., Krewer, D., Washington, A., & Richardson, M. (2017). Outside The Box: Building a Digital Asset Management Ecosystem for Preservation and Access. *Code4Lib*, (36). Retrieved from https://journal.code4lib.org/articles/12342

Van Malssen, K. (n.d.). Getting to success: A scenario-driven approach for selecting, implementing and deploying digital asset management systems. *Journal of Digital Media Management*, *7*(4), 330–338.

Zerfass, A., & Volk, S. C. (2018). How communication departments contribute to corporate success. *Journal of Communication Management*, *22*(4), 397–415. doi: 10.1108/jcom-12-2017-0146

Appendix A

Metadata Field Overview Chart

Field Name	Mapped to Dublin Core Element	Priority	Repeatable	Recommended Controlled Vocabulary
Original File Name	Identifier	Mandatory	No	None
Job Number	Identifier	Mandatory	No	None
Title	Title	Mandatory	No	None
Description	Description	Recommended	Yes	None
Campaign Name	Description	Mandatory	Yes	None
Requestor	Relation: isPartOf	Recommended	Yes	None
Service Line	Relation: isPartOf	Mandatory	Yes	Local
Subject	Subject	Optional	Yes	None
Tactic Type	Description	Mandatory	Yes	Local
Creator	Creator	Mandatory	Yes	None
Advisor	Creator	Recommended	Yes	None
Designer	Creator	Recommended	Yes	None
Writer	Creator	Recommended	Yes	None
Photographer	Creator	Optional	Yes	None
Video Producer	Creator	Optional	Yes	None
Date of Completion	Date	Mandatory	Yes	None
Featured person	Description	Optional	Yes	None
Location	Coverage	Recommended	Yes	Local
Location Type	Type	Optional	Yes	Local
Dimensions	FormatExtent	Recommended	Yes	None
File Type	FileFormat	Mandatory	Yes	IANA
Version	Relation:IsVersionOf	Mandatory	Yes	None
Approved by	none	Optional	Yes	None
Copy Approved by	none	Optional	Yes	None
Brand approved by	none	Optional	Yes	None
Notes	none	Optional	Yes	None
Usage rights	none	Recommended	Yes	None
Keywords	none	Mandatory	Yes	Local

Appendix B

Examples of Metadata Field Detailed Descriptions

Service Line

Label	Service Line
Mapped to DC Element	Relation: isPartOf
Mandatory	Mandatory
Repeatable	Yes
Controlled Vocabulary	Local
Field Type	Single-value field – authority list

Description:

The department in which this project or asset falls under.
Choose from the list provided. Can add more than one service line if necessary.

Examples:

Behavioral Health
Human Resources
Cardiology

Subject

Label	Subject
Mapped to DC Element	Subject
Mandatory	Optional
Repeatable	Yes
Controlled Vocabulary	Local
Field Type	Text – less than 500 chars

Description:

The term that describes the content of the asset.
Terms can be a medical condition or a subspecialty.
Limit terms to no more than five, use commas to separate subject terms.

Examples:

Heart care
Hospice
Flu

Appendix C

Keyword List

Assets
3D Visual
Background
Doctors Photo
Header and footer
Headshots
Icon
Image
Logo
Map
Motion Graphic
Placeholders
Portrait
Slogans
Stock
Photography
Templates
VFX
Web Portrait

Attributes
Arrows
Blue
Brand Colors
Fonts
Gradient
Ink drops
Square
Texture

Campaign Type
Annual Report
Awards
CME
Commercial
Employee Giving
Event
Grateful Patient
Holiday
Patient Story
Year in Review

Employment
Employed
Not Employed

Miscellaneous
Baby
Benefits
Brag
Business Segment
Compass
Content
Family
Firsts
Flu
Health
Heart Care
Heart Facts
Influenza
Interview
Leadership
Medicine
Mobile
New Doctor
News
News Package
Outcome
Recipe
Reports
Research
Retirement
Robot
ROI
Sales Kit
Save the Date
SEO
Sitemap
Stats
Success
URL
Web
Web size
Wellness

Process
Approved
Not Approved

Profession
Doctor
Manager
Nurse

Services
Concussion Facts
Employee
Wellness
Heart
Hospice
IORT

Social
Boosted
Facebook Ad
Facebook Live
Organic
Social Content

Status
Comp
Archive
Final
In progress
Internal
Mock up
Mood Board
On hold
Restricted use

Tactic Type
Ad
Animation
Banner
Banner image
bi-fold
Booklet
Brochure
Business Card
Carousel Ad
Cling
Copy
Digital
Digital Display
Display
Editable PDF
Email
Email Marketing
Envelope
Evite
Flyer
Folder
Infographic
Invitation
Mailer
Photography
Pins
Poster
PowerPoint
Print
Print Ad
Profile Cards
Program
Rack Card
Referral Cards
Retractable Banner
Script
Sell Sheet
Signage
Social Media
Stationery
Swag
T-shirts
Tri-fold
Video
Wall Cling
Web banner
Website